REMARKS

Claims 1-16 are pending in this application, and in the Office Action, the Examiner rejected all of these claims under 35 U.S.C. §102 as being fully anticipated by U.S. Patent 6,307,791 (Otsuka, et al.).

In order to better define the subject matter of the claims, independent Claims 1 and 9 are herein being amended.

For the reasons discussed below, Claims 1-16 patentably distinguish over the prior art and are allowable. The Examiner is thus asked to reconsider and to withdraw the rejection of, and to allow, Claims 1-16.

As explained in detail in the present application, this invention relates to an I/O cell having a programmable active input bias. In the invention, a reference cell is used to determine the extent to which a driver impedance of the I/O cell should be adjusted to keep that impedance within a given range of a certain value. The reference cell includes a series of resistance devices that are activated to determine a digital signal that is transmitted to the driver to change the impedance of the driver.

Otsuka, et al. discloses a semiconductor device having an output impedance controller that controls the impedance of an output buffer. The impedance controller shown in Figure 6 of Otsuka, et al. includes an external resistor RQ, and two dummy buffers including transistors Ndm and Pdm. The impedance of the dummy buffers is equalized with the resistor RQ, and the impedance of the output buffer 70 is adjusted according to adjustments made on the impedance of the dummy buffers.

Otsuka, et al, however, fails to disclose or suggest several important features of the present invention. One of these features is that, with this invention, the reference cell includes a copy of a set of resistance devices of the I/O driver. While Otsuka, et al. uses pull-up and pull-down transistors, there is no teaching of providing the reference cell with a copy of resistance devices used in the I/O driver.

This feature is of significant utility because it enables the reference cell to better match the exact resistance of the I/O driver, including manufacturing and temperature variations.

The other references of record have been reviewed, and it is believed that these other references are no more pertinent than Otsuka, et al. In particular, these other references, whether they are considered individually or in combination, also do not teach the principal of providing the reference cell with a copy of a set of resistance devices used in the I/O driver.

Independent Claims 1 and 9 clearly describe this difference. In particular, Claim 1, which is directed to a method of impedance control, indicates that the I/O cell includes a given set of resistance devices, and that the reference cell includes a copy of that given set of resistance devices. Similarly, Claim 9, which is directed to a circuit for controlling the impedance of an I/O cell, indicates that this I/O cell includes a given set of resistance devices, and this claim positively sets forth the limitation that the control circuit includes a copy of that given set of resistance devices.

In view of the above-discussed differences between Claims 1 and 9 and the prior art, and because of the advantages associated with those differences, it cannot be said that Claims 1 or 9 are anticipated by or obvious in view of the prior art. Accordingly, these claims patentably distinguish over the prior art and are allowable. Claims 2-8 are dependent from, and are allowable with, Claim 1; and Claims 10-16 are dependent from Claim 9 and are allowable therewith.

For the reasons set forth above, the Examiner is respectfully requested to reconsider and to withdraw the rejection of Claims 1-16 under 35 U.S.C. §102, and to allow these claims. If the Examiner believes that a telephone conference with Applicants' Attorneys would be advantageous to the disposition of this case, the Examiner is asked to telephone the undersigned.

Respectfully submitted,

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